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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GUGLIOTTA, NICOLE T	

ART UNIT	PAPER NUMBER
1709	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/531,873	Applicant(s) UCHIDA ET AL.	
	Examiner Nicole T. Gugliotta	Art Unit 1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 7-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/531873.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 7 – 14 are provisionally rejected on the ground of nonstatutory double patenting over claims 9 - 16 of copending Application No. 10/ 531,578. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

3. Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications disclose the use of an alkali metal source, with a range of 0.01 – 10 parts by mass of alkali metal source with respect to 100 parts by mass of aggregate raw material. These two applications are the same. This

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application explicitly states the alkali metal source as the reinforcing material.

Application No. 10/531,578 refers to "colloidal particles" as the reinforcing material.

However, the specification mentions an alkali metal source in the method of manufacture (Sections 0010 and 0033).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 103

4. Claims 7 - 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (U.S. Patent No. 6,716,512 B2).

5. Applicant claims (claims 7 and 11) the method and product of manufacturing a honeycomb structure by mixing and kneading raw materials, an organic binder, and alkali metal source, water, and a pore-forming agent. The raw materials comprised of metal silicon or a non-oxide ceramic containing silicon. After, the mixture undergoes the formation into a honeycomb shape, calcinating, and then firing. Applicant claims (claims 8 and 12) the alkali metals to be 0.01 – 10 parts by mass with respect to 100 parts by mass of the aggregate raw material, and that raw material consisting of silicon carbide, silicon nitride, or metal silicon (claims 9, 10, 13, and 14).

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6. In regard to claims 7, 9, 10, 11, 13 and 14, Yamamoto et al. teach a method of manufacturing a porous honeycomb structure by mixing and kneading raw materials, an organic binder, and an alkali metal source (Column 3, Lines 56 – 60), forming the material into the desirable honeycomb shape, calcinating, and then firing the honeycomb structure (Column 6, Lines 20 – 26). The raw materials may be made of SiC or Si₃N₄ (Column 3, Lines 61 - 63). Yamamoto et al. teach the addition to this mixture an alkali metal source (referred to as the “vitrifying material”), such as sodium oxide, lithium oxide and potassium oxide (Column 4, Lines 49 – 54). Although this is a porous honeycomb microstructure, it does not contain pore-forming agent.

7. In regard to claims 8 and 12, Yamamoto et al., teach an alkali metal concentration to be 5% by weight or less, more preferably to be 1% by weight or less (Column 4, Lines 39 - 46).

8. It would be obvious to one skilled in the art at the time the invention was made to mix raw material comprised of silicon, organic binder, a source of alkali metal and a pore-forming agent (if one desires a porous ceramic honeycomb), and then to proceed with the standard method of forming the structure, calcinating to remove the organic binders, and then firing the body. In this case, the parts by mass are with respect to 100 parts by mass. Therefore, 0.01 parts by mass is equivalent to 0.01 % by weight, and 10 parts by mass is equivalent to 10% by weight.

9. It would have been obvious to one skilled in the art at the time the invention was made to have a small concentration for alkali metal in a honeycomb structure, as this is suggested.

10. Claims 7, 9, 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stobbe et al. (U.S. 7,179,430 B1).

11. In claims 7 and 11, applicant claims a method of manufacturing a porous honeycomb structure by mixing an aggregate raw material comprising silicon and/or a non-oxide ceramic containing silicon. Applicant further defines those silicon materials to include silicon carbide, silicon nitride, and metal silicon (claims 9, 10, 13 and 14).

12. Yamamoto et al. teach the use of raw materials, such as SiC or Si₃N₄, in the manufacturing of a ceramic honeycomb structure.

13. Stobbe et al. also teach a porous honeycomb microstructure containing pore-forming agent (Column 6, Lines 36 – 49). Like Yamamoto et al, Stobbe also teaches the use of raw materials, such as SiC or Si₃N₄ (Column 5, Lines 30 – 33 and Column 7, Line 20).

14. It would have been obvious to one skilled in the art at the time the invention was made to have a ceramic honeycomb structure comprising a raw material of silicon carbide or silicon nitride, as it is very well known in the art.

15. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al., in view of Noda et al. (U.S. Patent No. 7,041,358 B2).

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16. Applicant claims (claims 8 and 12) clay containing 0.01 – 10 parts by mass of alkali metal source (reinforcing material) with respect to 100 parts by mass of aggregate raw material.

17. Yamamoto et al. teach the parts by mass of alkali metal in a ceramic honeycomb mixture to be within the range of 0.01 – 10.

18. Noda et al. (Column 5, Lines 41 – 48) also mentions the preferable range of reinforcing material to be from 0.5 – 10 parts by mass when the total mass of the honeycomb structure before reinforcement is taken to be 100 parts per mass.

Reinforcing materials include a composite oxide and an alkali metal, in the reinforcement areas portion (the end portions of the partition wall).

19. It would be obvious to one skilled in the art at the time the invention was made to use alkali metal in the ceramic material in order to strengthen the ceramic structure and then to use a low concentration of alkali metal, such 0.5 – 10 parts by mass.

20. Claims 7, 8, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al., in view of Park et al. (U.S. Patent No. 5,914,294).

21. Applicant (claims 7 and 11) discloses the addition of an alkali metal sheet to obtain clay. Applicant's specification further discloses the purpose for the alkali metal is to dissolve in water, releasing hydroxide, which then in turn reacts with the silicon to form alkali silicate glass (water glass). This glass acts as a reinforcing agent after the binder has burnt out.

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22. In regard to claims 7 and 11, Yamamoto et al. disclose a method or manufacturing a porous honeycomb structure of silicon carbonide and an alkali metal, such as sodium oxide, lithium oxide, and potassium oxide. However, they do not teach the use of combining the alkali metal and the silicon carbonide to produce alkali silicate glass as a means of strengthening the honeycomb structure.

23. Park et al. disclose a method of manufacturing a monolithic honeycomb structure by mixing a raw material (in this case carbon), water, binder (can be organic), and an alkali metal source (sodium silicate).

24. In regard to claims 8 and 12, Yamamoto et al. discloses a concentration range of 0.1 – 10 parts by mass when the total mass is 100 parts.

25. Park et al. also teach a alkali silicate (sodium silicate) to be desirable up to 7 parts by weight, and more desirably 2 – 7 parts by weight (Column 6, Lines 48 – 53).

26. It would have been obvious to one skilled in the art when the invention was made to add water to a ceramic mixture already containing alkali metal and silicon oxide to create an alkali silicate glass because it is well known in the art that alkali silicates (such as sodium silicate) increase the strength of a honeycomb structure, as suggested by Park et al. The concentration range utilized by Park et al. is within the scope of the range taught by applicant. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have a low concentration range of alkali metal in the honeycomb structure.

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27. Claims 7, 9, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al, in view of Joulin et al. (U.S. Patent 6,582,796 B1).

28. Applicant (claims 7 and 11) discloses the addition of an alkali metal sheet to obtain clay, as well as a total mass of silicon carbide, silicon nitride or metal silicon to be 50% mass or more of a total mass of the aggregate raw material (claims 9, 10, 13, and 14).

29. In regard to claim 7 and 11, Yamamoto et al. teach the addition of an alkali metal source into a mixture containing silicon carbide for the manufacturing of ceramic honeycomb structures.

30. Joulin et al. (Column 2, Lines 10 – 19) also teaches the addition of an alkali metal source (potassium oxide, lithium oxide or sodium oxide), among other compounds, to a mix containing silicon carbide for making a ceramic honeycomb structure to be formed, dried and heated.

31. In regard to claims 9, 10, 13, and 14, Yamamoto et al. disclose the use of silicon carbonide in the method of manufacturing, but does not specify a quantitative amount of silicon in the material.

32. Joulin et al. (Column 2, Lines 6 – 8) disclose the amount of silicon carbide to be as great as 97% by mass.

It would have been obvious to one skilled in the art at the time the invention was made to add an alkali oxide and silicon carbide to a ceramic honeycomb mixture, with

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the silicon carbide having a mass of 50% by mass or more, as suggested by Joulin et al.

33. Claims 7 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al., in view of Domesle et al. (U.S. Patent 6,710, 014 B2).

34. Applicant (claims 7 and 11) discloses the addition of an alkali metal sheet to obtain clay. Applicant's specification further discloses the purpose for the alkali metal is to dissolve in water, releasing hydroxide, which then in turn reacts with the silicon to form alkali silicate glass (water glass). This glass acts as a reinforcing agent after the binder has burnt out.

35. Yamamoto et al. teach the addition of alkaline metal to a ceramic honeycomb mixture during the manufacturing process. However, Yamamoto et al. does not disclose a possible reason for adding the alkali metal is to produce alkali silicate glass (water glass) within the mixture.

36. Domesle et al. (Column 3, Lines 25 – 35) disclose a ceramic material comprising a reinforcing material, such as alkaline silicates (water glass). In addition, this reinforcing material may be applied in several ways: impregnating the ceramic material or applying a reinforcing coating to the channel walls (Column 3, Lines 14 – 19).

37. It would be obvious to one skilled in the art at the time of the invention that alkali silicate glass (water glass) is a known reinforcing material used in ceramic honeycomb structures. Therefore it would be obvious to mix into the ceramic material the chemicals

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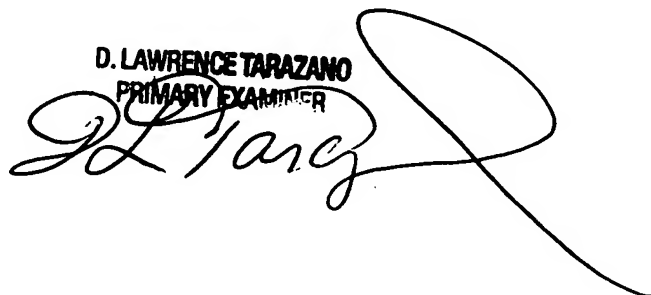
necessary for making alkali silicate glass ($\text{Alkali metal} + \text{H}_2\text{O} + \text{Si} \rightarrow \text{alkali silicate glass}$). Since it is already obvious to have SiC and an alkali oxide included in a ceramic mix (see above rejections), it would be obvious to simply include water in the mixture to ensure the product of an alkali silicate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole T. Gugliotta whose telephone number is 571-270-1552. The examiner can normally be reached on M - F (first Friday off) 7:30 a.m. - 5 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1550. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D. LAWRENCE TARAZANO
PRIMARY EXAMINER


Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :4/19/2005, 8/10/2005, 7/5/2006, 6/29/2007.